NEWFOUND LAKE

2017 SAMPLING HIGHLIGHTS

Station - Deep 1

Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Light Gray = No Data

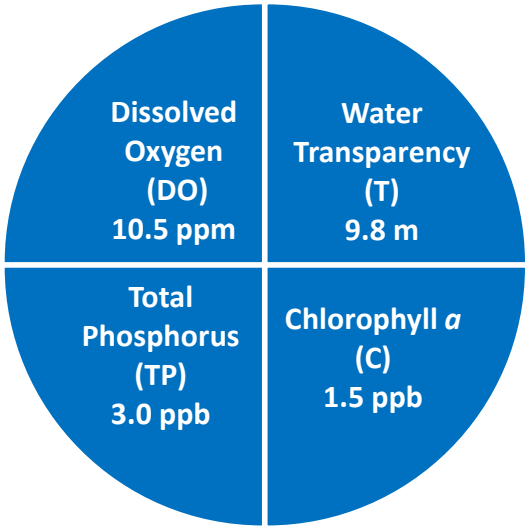


Figure 1. Station Deep 1 Water Quality (2017)

Table 1. 2017 Station Deep 1 Seasonal Averages and NHDES Trophic Level Classification Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Station Deep 1 Average (range)	Station Deep 1 Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	**9.8** meters (range: 8.9 – 10.5)	**Oligotrophic**
Chlorophyll *a* (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	**1.5** ppb (range: 1.4 – 1.6)	**Oligotrophic**
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	**3.0** ppb (range: 2.4 – 3.6)	**Oligotrophic**
Dissolved Oxygen (ppm)	5.0 – 7.0	2.0 – 5.0	<2.0	**10.5** ppm (range: 10.0 – 10.6)	**Oligotrophic**

*** Dissolved oxygen concentrations measured on 8/22/17 between 11.5 and 31.2 meters in the bottom water layer.**

Table 2. 2017 Station Deep 1 Seasonal Average Accessory Water Quality Measurements.

Parameter	Assessment Criteria					Station Deep 1 Average (range)	Station Deep 1 Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**10.5** color units (range: 8.0 – 13.0)	Slightly colored
Alkalinity (ppm)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	**4.4** ppm (range: 4.2 – 4.5)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.1** standard units (range: 7.1 – 7.1)	Optimal range for fish growth and reproduction
Specific Conductivity (*u*S/cm)	< 50 *u*S/cm Characteristic of minimally impacted NH lakes		50-100 *u*S/cm Lakes with some human influence	> 100 *u*S/cm Characteristic of lakes experiencing human disturbances		**40.1** *u*S/cm (range: 39.8 – 40.5)	Characteristic of minimally impacted NH lakes

Recommendations for Property Owners:

Implement Best Management Practices within the Newfound Lake watershed to minimize the adverse impacts of polluted runoff and erosion into the lake. Refer to "Landscaping at the Water's Edge: An Ecological Approach" and "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home" for more information on how to reduce nutrient loading caused by overland run-off.

- https://extension.unh.edu/resources/files/Resource001799_Rep2518.pdf
- http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf

LONG TERM WATER QUALITY

Site Deep 1 is the most centrally located of the Newfound Lake sampling locations (Figure 4) and provides the best representation of the overall condition of Newfound Lake. The condition of site Deep 1 is a reflection of the various inputs that enter the lake through the drainages to the north and many points to the east and west of Newfound Lake. Further review of water quality measurements at the other Newfound Lake sampling locations will provide a better assessment of more localized pollutant inputs that impact the other sampling locations (refer to the 2017 summary data contained in Table 3).

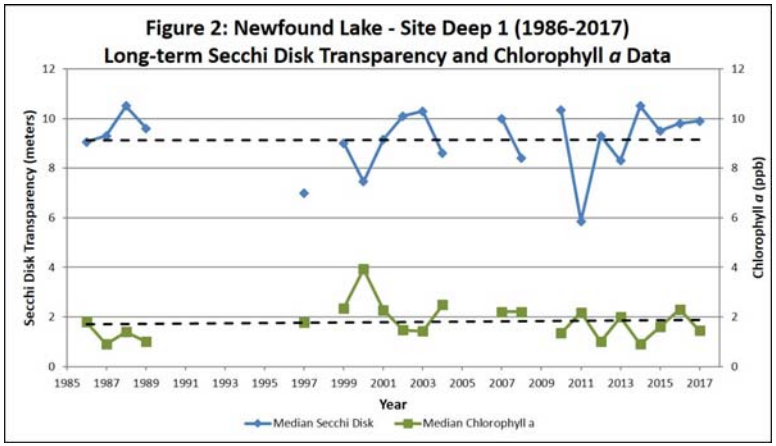
WATER CLARITY: The site Deep 1 Lake water clarity data do not display a trend over the twenty-one years of sampling (1986–2017).

CHLOROPHYLL: The site Deep 1 Lake chlorophyll *a* data display a trend of increasing chlorophyll *a* concentrations over the twenty-one years of sampling (1986–2017).

COLOR: The site Deep 1 color data display a trend of increasing color concentrations over the seventeen years of sampling (1988–2017).

TOTAL PHOSPHORUS: The site Deep 1 total phosphorus concentrations do not display a trend over the past nineteen years of sampling (1986-2017).

In summary, site Deep 1 and Newfound Lake continue to show excellent water quality conditions. However, there are some indications of a slight increase in the chlorophyll *a* concentrations. One should be aware that water quality data have not been collected on an annual basis and that data gaps among years exist (Figure 2 and 3).



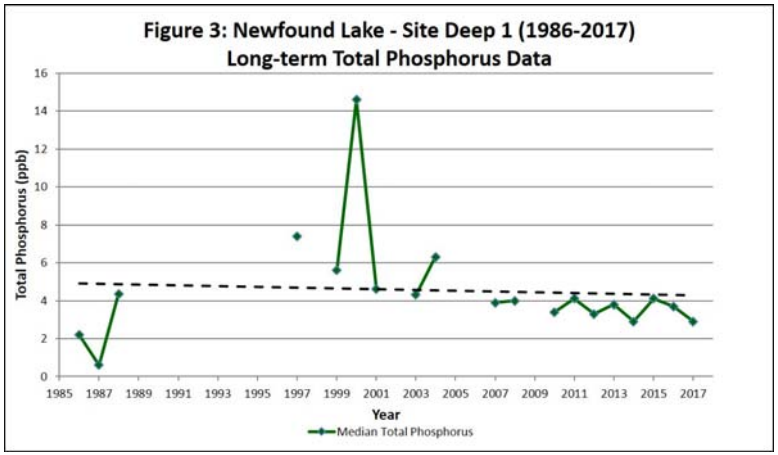


Table 3. Seasonal Average Water Quality by Sampling Location (2017)

Site	Average Secchi Disk Transparency (meters)	Average Chlorophyll *a* (ppb)	Average Total Phosphorus (ppb)	Average Dissolved Oxygen (ppm)
Deep 1	9.8	1.5	3.0	10.5
Mayhew 2	8.3	1.9	4.6	3.2
Pasquaney 3	8.7	2.0	3.2	10.4
Loon Island 4	9.2	2.0	4.0	XXXX
Cockermouth 5	9.2	2.2	3.5	10.2
Beechwood 6	9.3	1.6	3.3	10.5
Follansbee 8	9.8	1.7	3.4	10.4

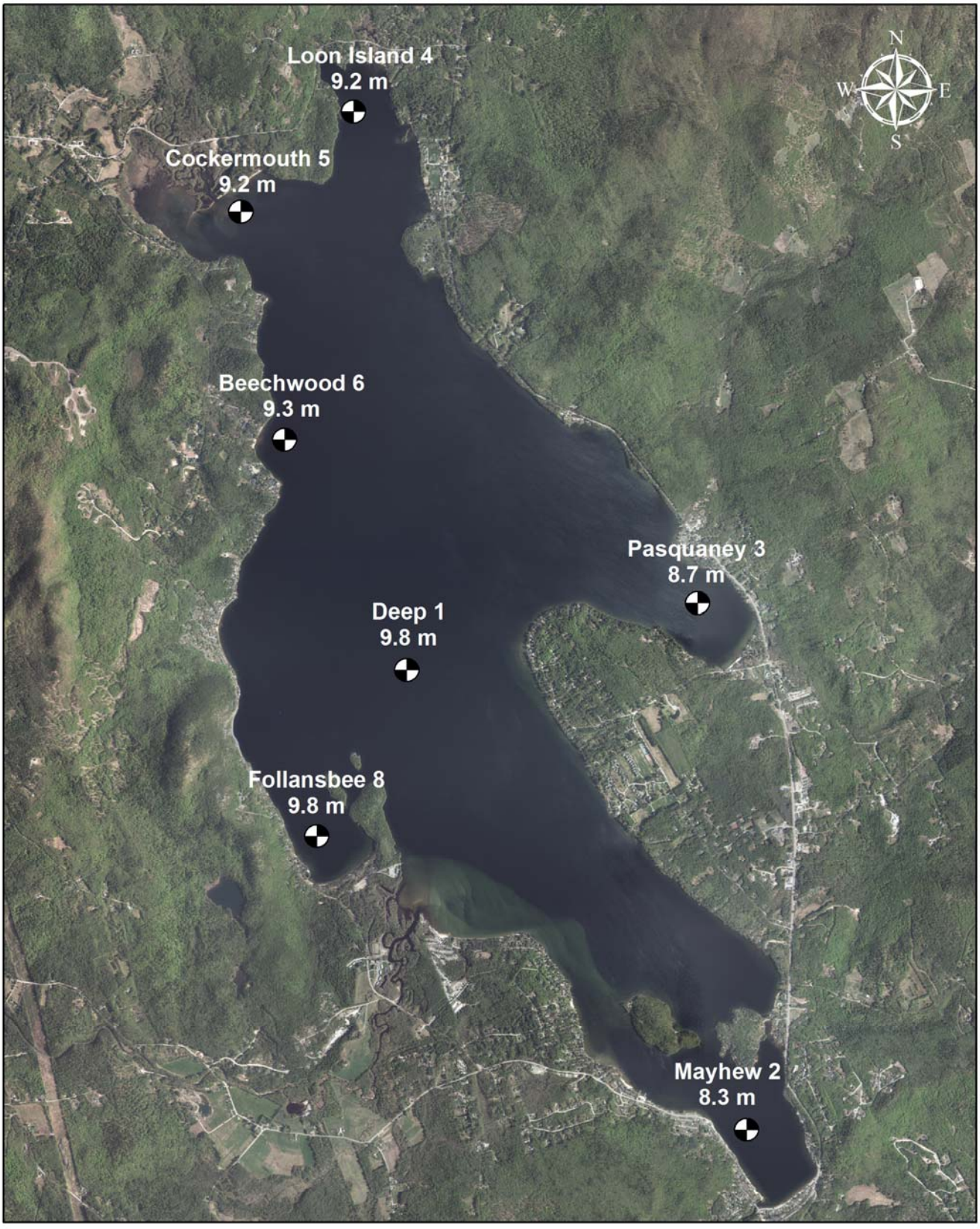
XXXX indicates site is too shallow to collect comparable oxygen data.

Figures 2 and 3. Changes in the Newfound Lake water clarity (Secchi Disk depth), chlorophyll *a* and total phosphorus concentrations measured between 1986 and 2017 at site Deep 1. **These data indicate the relationship between plant growth and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Note: due to difficulties in accessing the deep site and personnel limitations, there are years when site Deep 1 was not sampled between 1986 and 2017.

Figure 4. Newfound Lake

Bristol, Alexandria, Bridgewater & Hebron, NH

2017 Deep sampling sites with seasonal average water clarity



Aerial Orthophoto Source: NH GRANIT
Site location GPS coordinates collected by the UNH Center for Freshwater Biology